BOX2D: JOINTS

BOX2D

What's Box2D?

- Physics!!!

- A thin Java wrapper around the C++ engine

- References (RTFM):

  - https://box2d.org/manual.pdf

  - https://github.com/libgdx/libgdx/wiki/Box2d

Summary

- Initialization

```
Box2D.init()
```

- Creating a World

```
World world = new World(new Vector2(gx,gy), true);
```

- Debug Renderer

```
Box2DDebugRenderer render=new Box2DDebugRenderer();
```

- Stepping the simulation (in the render() loop)
  - https://gafferongames.com/post/fix_your_timestep/

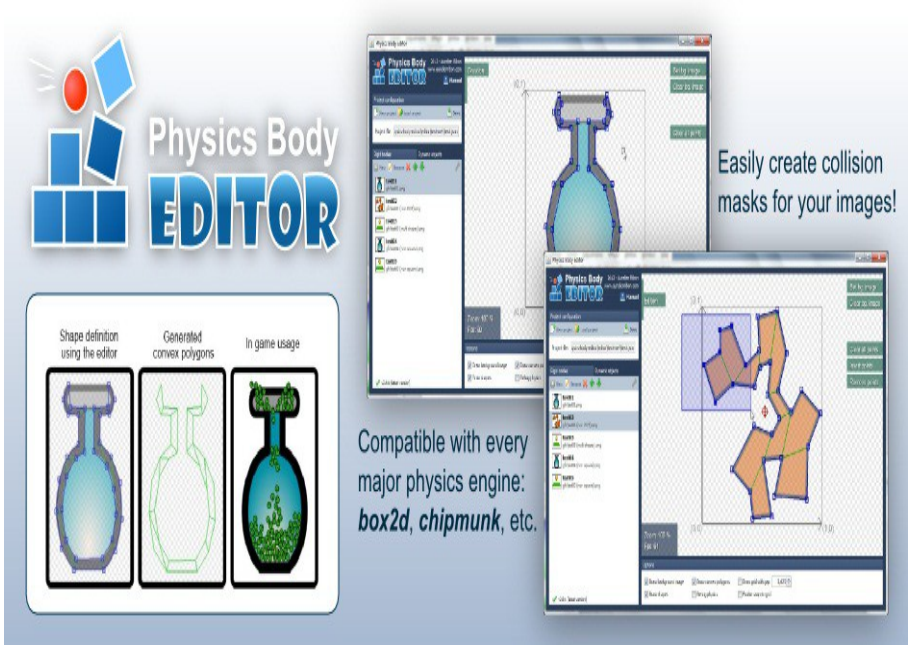
```
private float accumulator = 0;

private void doPhysicsStep(float deltaTime) {
    // max frame time to avoid spiral of death (on slow devices)
    float frameTime = Math.min(deltaTime, 0.25f);
    accumulator += frameTime;
    while (accumulator >= TIME_STEP) {
        WorldManager.world.step(TIME_STEP,VELOCITY_ITERATIONS,
POSITION_ITERATIONS);
        accumulator -= TIME_STEP;
    }
}
```

- Rendering

```
debugRenderer.render(world, camera);
```

- Bodies:
  - Static
  - Dinamic
  - Kinematic
- Impulses/Forces
- Fixture Shapes (box2d-editor)
- Sprites and Bodies (Box2D's User Data)
- Sensors
- Contact Listeners
- http://www.iforce2d.net/b2dtut/



- Units

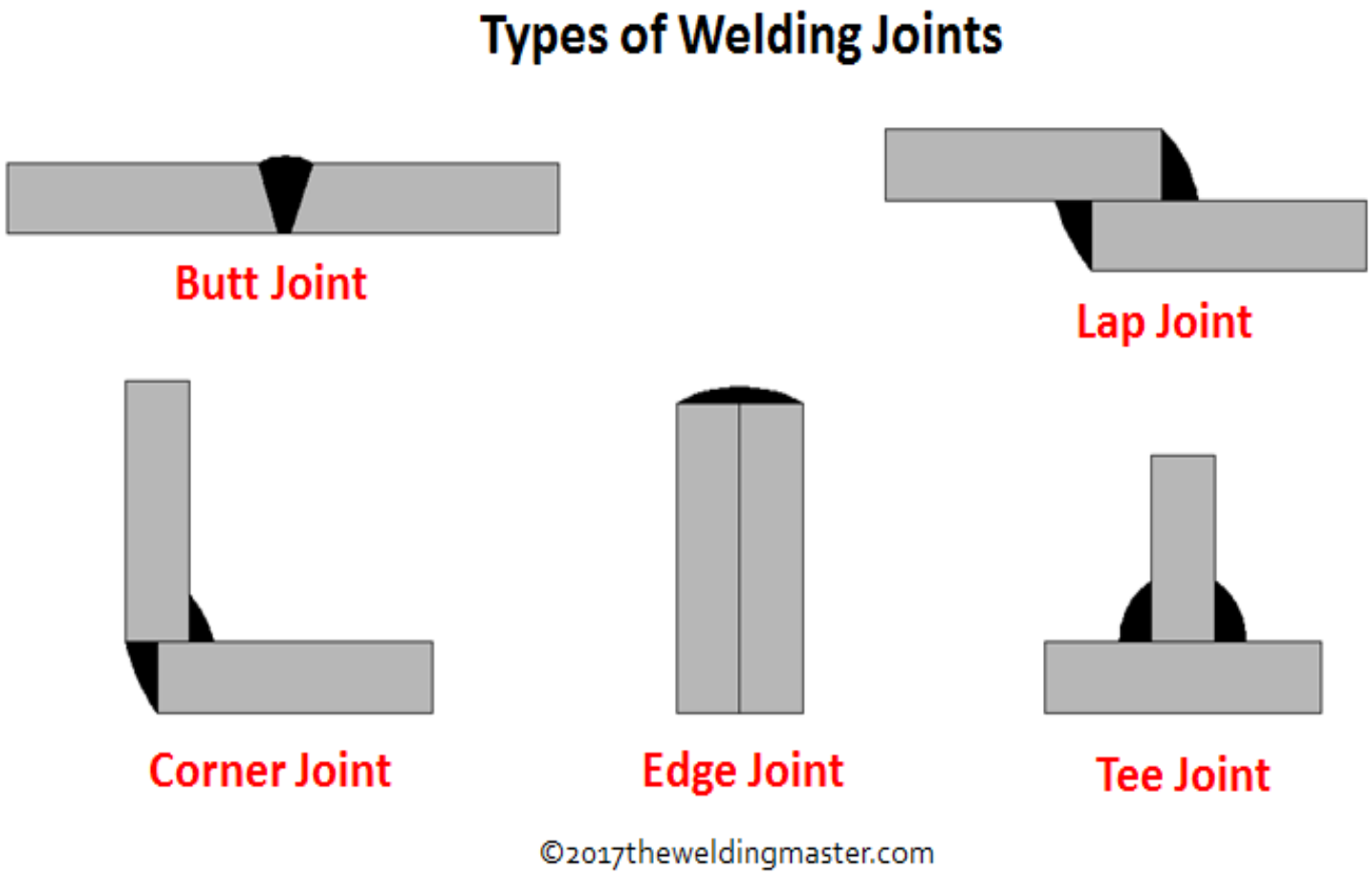
JOINTS:

What Is A Joint?

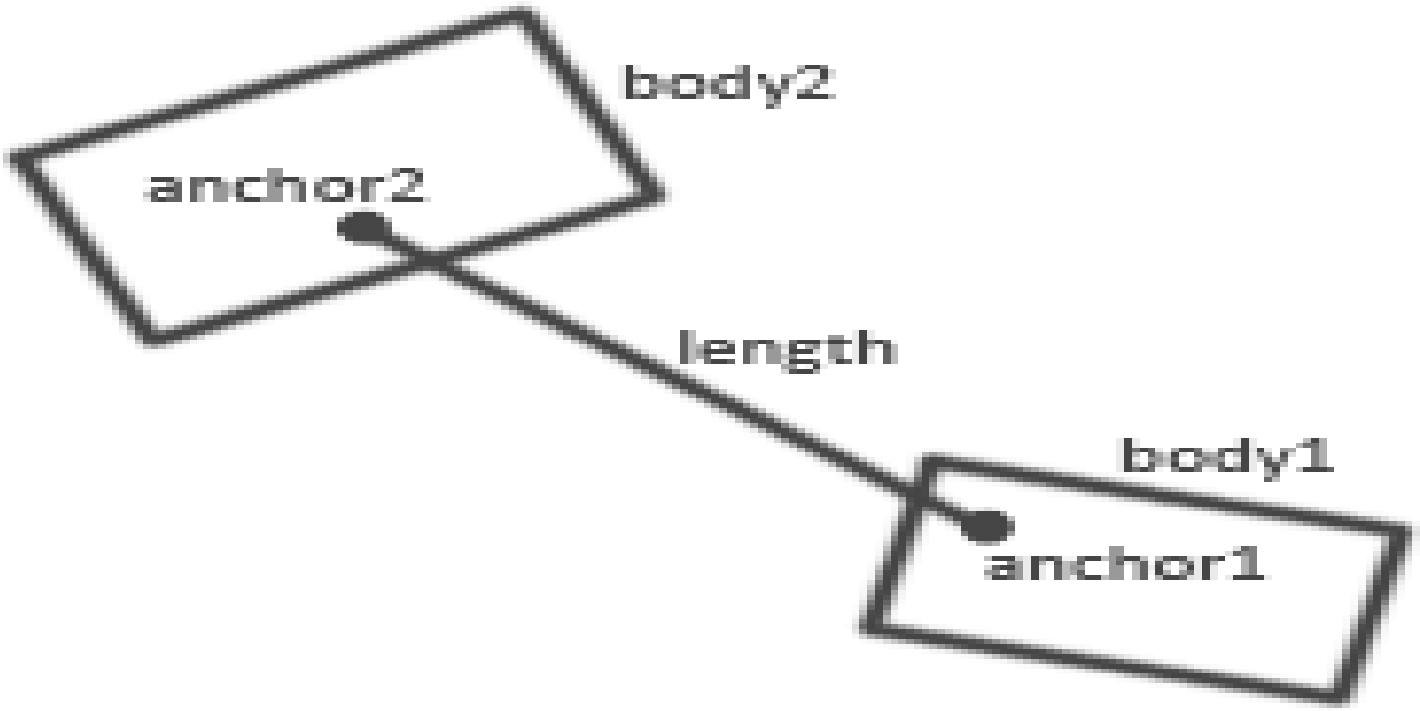
Types Of Joints In Box2D:

- Weld Joint
- Distance Joint
- Friction Joint
- Motor Joint
- Mouse Joint
- Prismatic Joint
- Pulley Joint
- Rope Joint
- Revolution Joint
- Wheel Joint
- Gear Joint

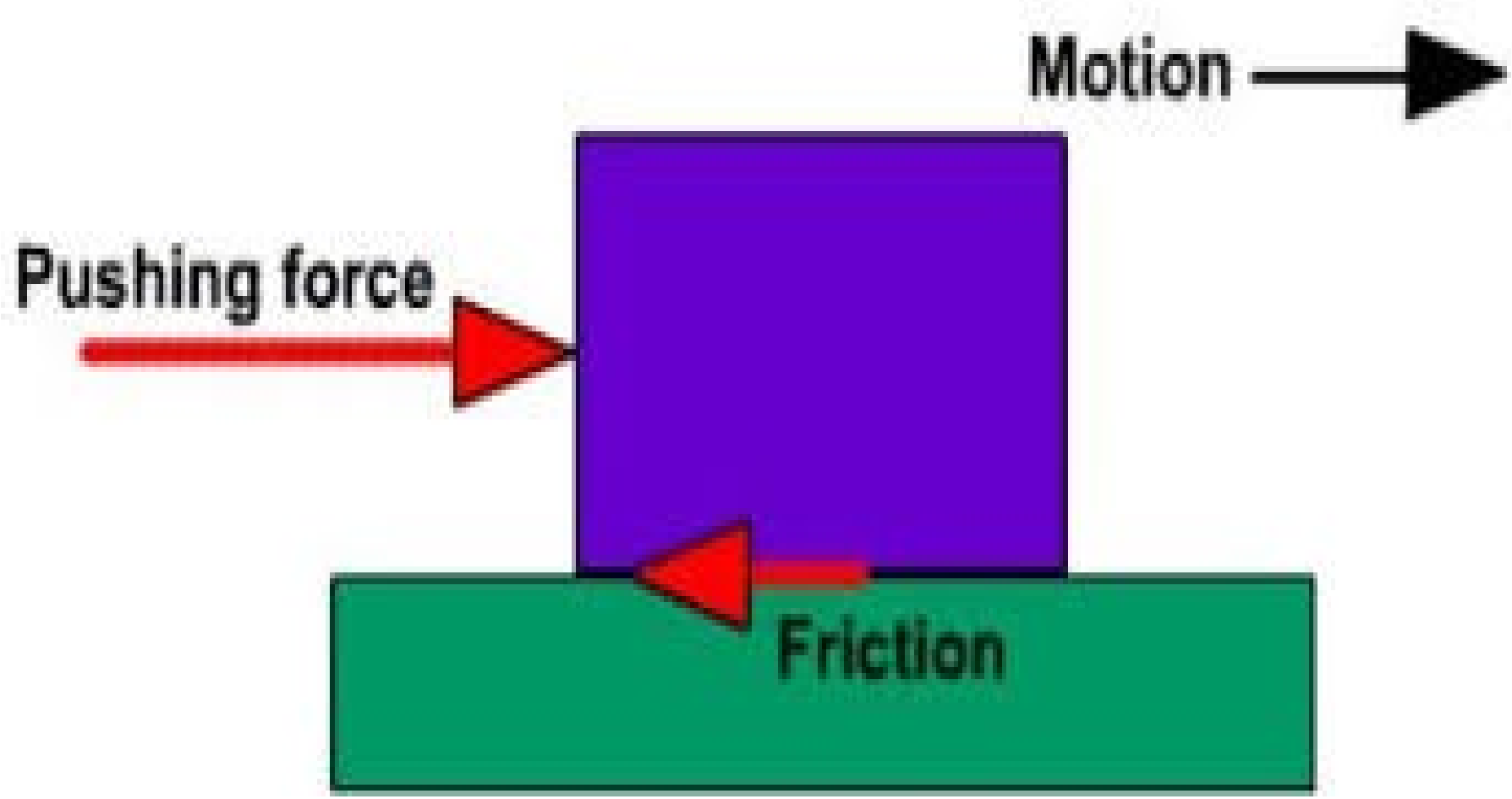
• Weld Joint


Types of Welding Joints
Butt Joint
Lap Joint
Corner Joint
Edge Joint
Tee Joint
©2017theweldingmaster.com

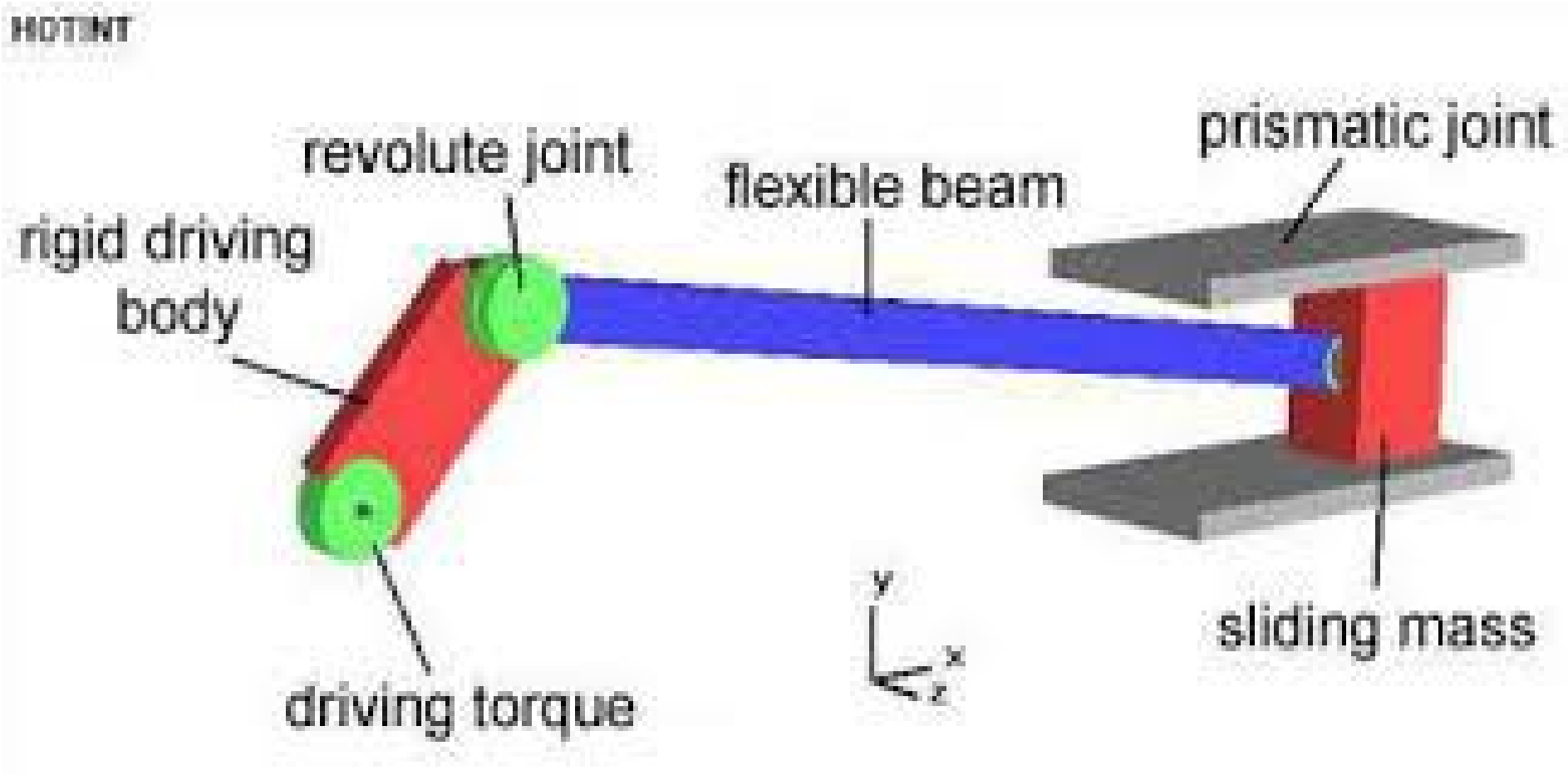
• Distance Joint



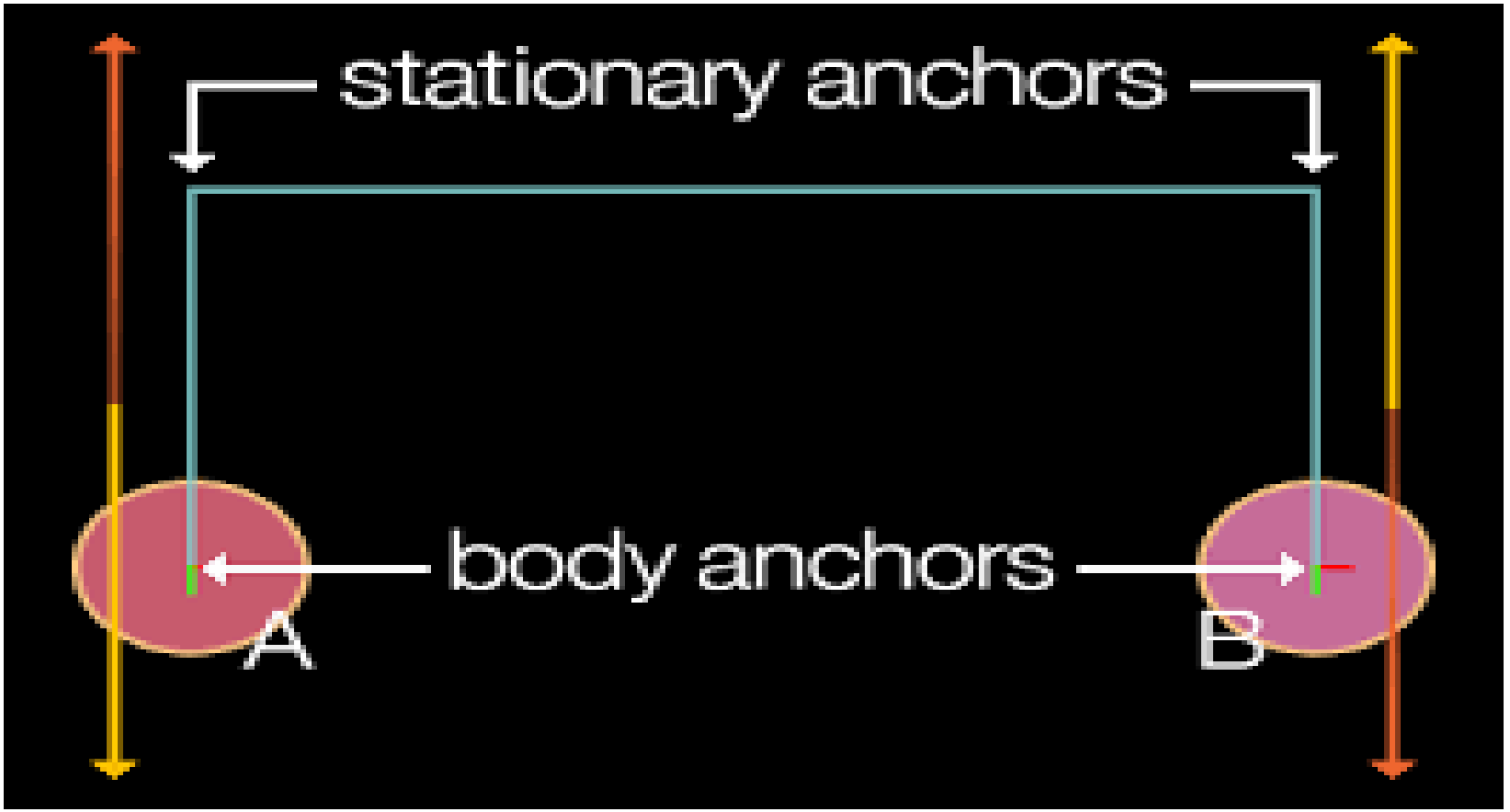
- Friction Joint



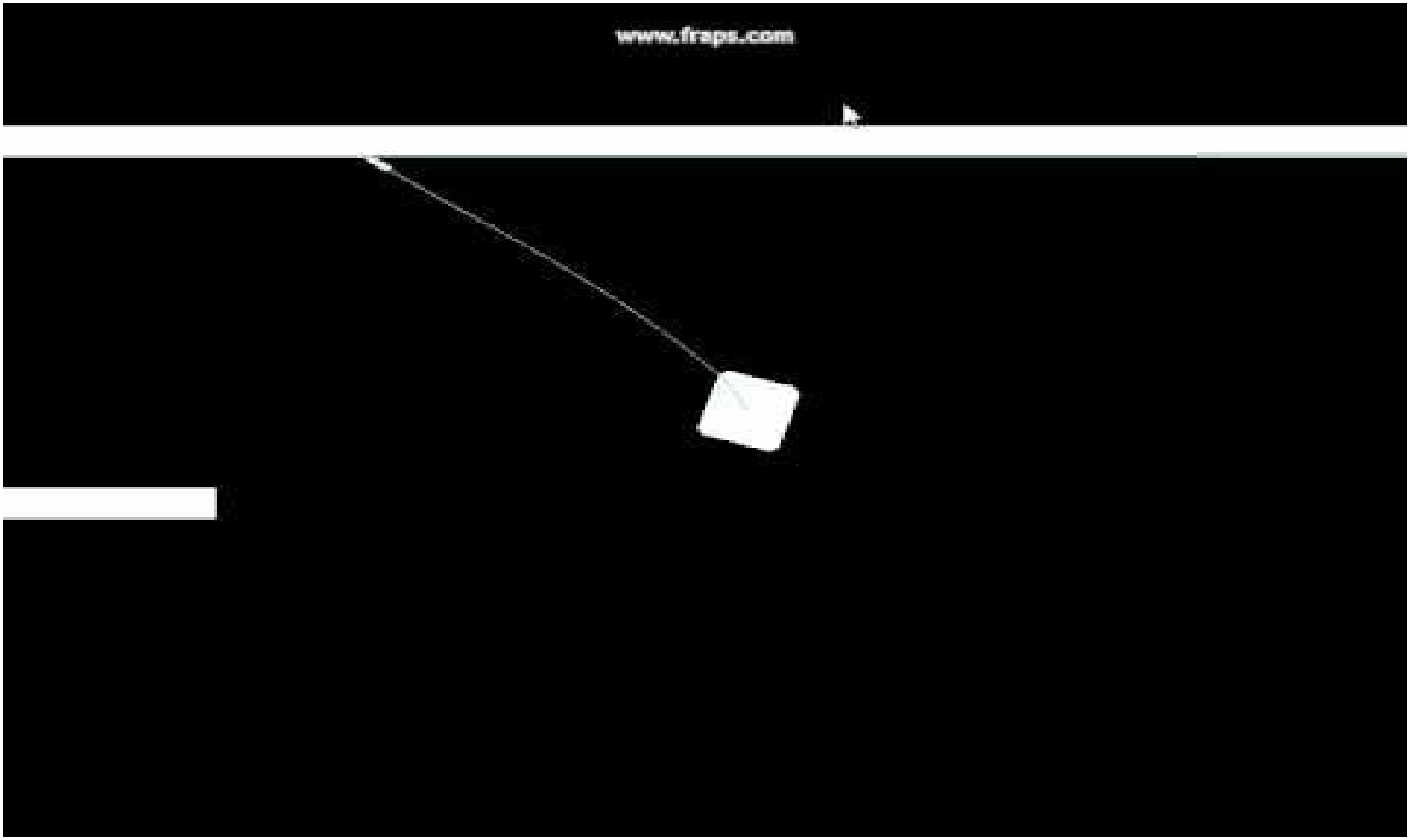
- Prismatic Joint, Revolute Joint & Gear Joint



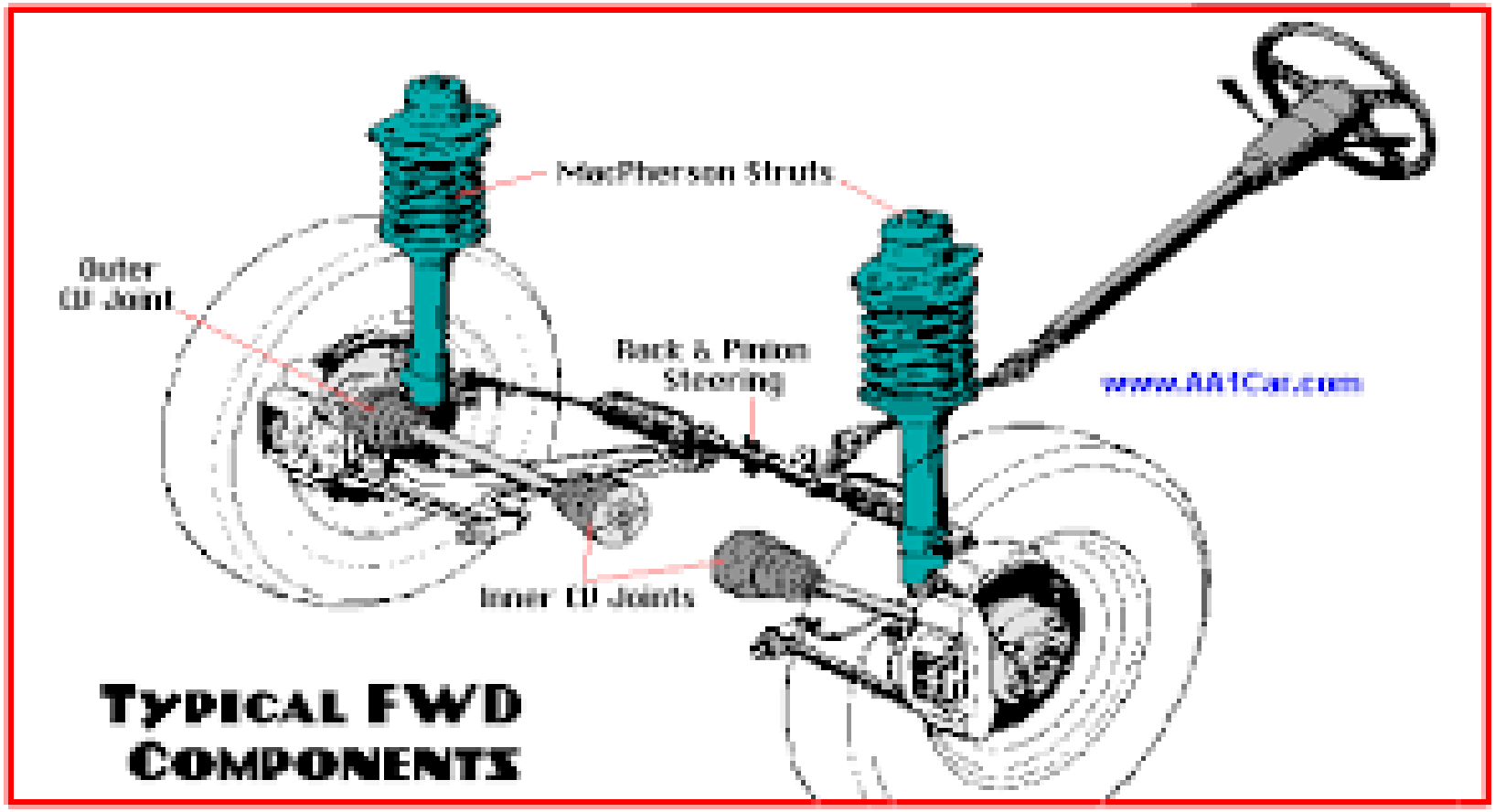
- Pulley Joint



- Rope Joint



• Wheel Joint


MacPherson Struts
Outer
CV Joint
Rack & Pinion
Steering
www.AA1Car.com
Inner CV Joints
TYPICAL FWD
COMPONENTS

Summary:

- Two bodys
- Different Anchors and constraints to do the joint definition

```
• world.createJoint(jointDefinition)
```

- Examples

THANKS TO ALL